

1773



PATENT  
Attorney Docket No. 42053.6USPT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Gunsell, et al

Serial No.: 09/534,282

Filed: March 24, 2000

Title: Lubricant for Magnetic Recording  
Medium and Use Thereof

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Examiner: K. Bernatz

Art Unit: 1773

Commissioner for Patents  
P. O. Box 2327  
Arlington, VA 22202

CERTIFICATE OF MAILING UNDER 37 C.F.R. § 1.8

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P. O. Box 2327, Arlington, VA 22202 on May 6, 2002

Printed Name: Gwen Landry  
Signature: Gwen Landry

Dear Sir:

TRANSMITTAL LETTER

Transmitted herewith in the above-identified application are:

- 1) Reply to Office Action mailed February 7, 2002;
- 2) Postcard;
- 3) Requisite fee for additional claims added by amendment (\$0.00). Calculations shown below.

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TC 1700

FOR	NUMBER FILED - PAID	NUMBER EXTRA	RATE	CALCULATIONS
TOTAL Claims	21 -21=	0	x \$ 18.00 =	\$0.00
INDEPENDENT Claims	5 -5=	0	x \$ 78.00 =	\$0.00
MULTIPLE DEPENDENT CLAIM(S) (if applicable)		N/A	0 x \$260.00 =	\$0.00
TOTAL OF ABOVE CALCULATIONS =				\$0.00
REDUCTION BY 1/2 FOR FILING BY SMALL ENTITY (Note 37 C.F.R. 1.9, 1.27, 1.28). IF APPLICABLE, VERIFIED STATEMENT MUST BE ATTACHED.				\$0.00
Total =				\$0.00

The Assistant Commissioner is hereby authorized to charge any additional fees required for this submission to Deposit Account 10-0447, reference 42053.6USPT(BAI).

Respectfully submitted,

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Reg. No. 43,481



PATENT  
DOCKET NO.: 42053.6USPT

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In Re Application of: Gunsel et al

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Examiner: K. Bernatz

Serial No.: 09/534,282

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Art Unit: 1773

Title: Lubricant for Magnetic Recording  
Medium and Use Thereof

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**TC 1700**

Commissioner for Patents  
P.O. Box 2327  
Arlington, VA 22202

Dear Sir:

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May 6, 2002

Signature

**RESPONSE TO OFFICE ACTION MAILED FEBRUARY 7, 2002**

In response to the Office Action mailed February 7, 2002, Applicants respectfully respond as follows. The three month deadline for responding to the Office Action expires on May 7, 2002. Since this reply is timely filed, no extension of time is necessary.

**RESPONSE TO REJECTION UNDER 35 U.S.C. § 103(A)**

To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. In re Vaack, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Factors including unexpected results, new features, solution of a different problem, novel properties, are all considerations in the determination of obviousness... When such factors are described in the specification, they are weighed in determining, in the first instance, whether the

prior art presents a prima facie case of obviousness. In re Wright, 848 F.2d 1216, 6 USPQ2d 1962 (Fed. Cir. 1988).

Claims 1, 2, 11-14, and 23-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stirniman et al. ("600") in view of Venier et al. ("023") and Venier, Casserly and Gunsell (IDS reference). In making the rejection, the Examiner states the following:

Regarding claims 1, 2, 13, 14, 30 and 31, Stirniman et al. disclose a magnetic recording medium comprising a non-magnetic support, a magnetic layer formed on the support, a protective layer formed on the magnetic layer and a lubricant layer over the protective layer (col. 1, lines 15-20 and col. 1, line 63 bridging col. 2, line 25). The examiner notes that claims 30 and 31 contain nominal method limitations and no restriction has been made between the product and the method. Amendment to introduce significant method limitations may result in restriction due to original presentation.

While Stirniman et al. disclose a perfluoropolyether F25 lubricant layer, Stirniman et al. fail to disclose a lubricant layer meeting applicant's claimed limitations (col. 5, lines 18 - 36).

However, Venier et al. ('023) and Venier et al. (IDS paper) teach lubricant compositions meeting applicants' claimed limitations which provide superior physical, optical and wear properties compared to perfluoropolyether Z25 lubricants (Venier et al. (IDS paper), sections 1, 6, 6.3.3 and 7; and Venier et al. ('023), col. 1, lines 15 - 26 and col. 4, line 43 bridging col. 5, line 47). The examiner acknowledges the lack of a date on the IDS paper to Venier et al., yet deems that the paper is clearly available as prior art since, based on the other provided Venier et al. references and Venier et al. ('023), it is clear that the research conducted by Venier and Casserly on the multiply-alkylated cyclopentanes was done around 1988 - 1992. Applicant's are requested to provide a date for the Venier et al. (IDS paper) if they feel that it is not applicable under 35 U.S.C 103(a).

Furthermore, Babb et al. teach that it is known in the art that lubricating oils for use as engine lubricants, as the Venier et al. ('023) lubricant compositions are disclosed as being suitable for (col. 7, lines 1-5), are also known to be useful for magnetic recording media (abstract and col. 1, line 17 bridging col. 2, line 18).

It would therefore have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Stirniman et al. to include a lubricant layer meeting applicant's claimed limitations as taught by Venier et al. ('023) in view of the general teachings of Venier et al. (IDS paper) and Babb et al. in order to provide a lubricant possessing superior physical, optical and wear properties compared to the perfluoropolyether lubricant used by the Stirniman et al. invention.

Regarding claims 11, 12, 23 and 24, while neither Venier et al. reference explicitly disclose the lubricant structure claimed by applicants', one of ordinary skill in the art would be motivated to make and use the claimed hydrocarbyl substituted lubricant in searching for a hydrocarbyl substituted cyclopentane, cyclopentene, or cyclopentadiene. The necessary motivation rises from the expectation that similar compounds will have similar properties. In re Payne, 606 F.2d 303, 203 USPQ 245 (CCPA 1979). The only difference between the disclosed lubricants and the lubricants claimed in the preceding claims is in the choice of the non-functionalized hydrocarbyl group that is substituted on the identical base compound.

Regarding claims 25-29, the added limitations are obvious to one of ordinary skill in the art since they are nominal magnetic head, data apparatus and computer limitations. It is old in the art to use lubricants on both the magnetic head portion, as well as the magnetic recording medium, as well as having the necessary power supply, magnetic head and computer components in order for the magnetic recording medium to be adequately used for its designed purpose. Amendment to include significant head or apparatus elements may result in restriction due to original presentation.

Regarding claims 32-35, Venier et al. ('023) disclose adding one or more additives to the lubricant layer meeting applicant's claimed limitations (col. 5, lines 48-63; col. 7, line 62 bridging col. 8, line 25; and col. 24, lines 27-53).

*Office Action of February 7, 2002, pages 2-4.*

Applicants have reviewed the above references and respectfully disagree that the above references, singularly or in combination, render the claimed invention obvious. Applicants' reasons are stated as follows.

Claims 1, 2, 11 - 14, and 23 - 35 are not rendered obvious by Stirniman et al. ('600") in view of Venier et al. ('023") and Venier, Casserly and Gunsell (IDS reference) because of unexpected results associated with the claimed invention. Superiority of a property shared with the prior art is evidence of nonobviousness. Therefore, the unexpected results prove nonobviousness.

Evidence of unobvious or unexpected advantageous properties, such as superiority in a property the claimed compound shares with the prior art, can rebut prima facie obviousness. "Evidence that a compound is unexpectedly superior in one of a spectrum of common properties . . . can be enough to rebut a prima facie case of obviousness." No set number of examples of superiority is required. In re Chupp, 816 F.2d 643, 646, 2 USPQ2d 1437, 1439 (Fed. Cir. 1987) (Evidence showing that the claimed herbicidal compound was more effective than the closest prior art compound in controlling quackgrass and yellow nutsedge weeds in corn and soybean crops was sufficient to overcome the rejection under 35 U.S.C. 103, even though the specification indicated the claimed compound was an average performer on crops other than corn and soybean.). See also Ex parte A, 17 USPQ2d 1716 (Bd. Pat. App. & Inter. 1990) (unexpected superior therapeutic activity of claimed compound against anaerobic bacteria was sufficient to rebut prima facie obviousness even though there was no evidence that the compound was effective against all bacteria).

The hydrocarbyl-substituted cyclopentane, hydrocarbyl-substituted cyclopentene , and hydrocarbyl-substituted cyclopentadienes of the claimed lubricant layer produce superior results when compared to traditional lubricants. From page 33, lines 22-26 and Table II, page 34:

"It is notable that the Pennzane® X-2000 lubricant films lasted longer than the Z-DOL® lubricant film. The films made from a solution containing 0.11 wt.% and 0.22 wt.% of Pennzane® X-2000 are **at least six times** more durable than the Z-DOL® lubricant film. Therefore, disk drives incorporating Pennzane® X-2000 or similar lubricants should have longer lifetime and improved performance."

Table II

Lubricant	Number of Cycles to Failure
Z-DOL® (0.1 wt.%)	8,000 to 10,000
Pennzane® X-2000 (0.055 wt.%)	10,000 to 35,000
Pennzane® X-2000 (0.11 wt.%)	<b>greater than 60,000</b>
Pennzane® X-2000 (0.22 wt.%)	<b>greater than 60,000</b>

Z-DOL® is a functionalized PFPE manufactured by Ausimont Montedison and should be viewed as the closest prior art. The above are unexpected and surprising results since the hydrocarbyl-substituted cyclopentane, hydrocarbyl-substituted cyclopentene , and hydrocarbyl-substituted cyclopentadienes are expected to have similar results when compared to lubricants of the prior art. From the Venier et al (IDS paper), section 7 and Table 5:

"Because it (tris(2-octyldodecyl)cyclopentane) has the desirable hydrocarbon properties of lubricity, additive solvency, and thermal stability, tris(2-octyldodecyl)cyclopentane is a viable hydrocarbon alternative to PFPE's for aerospace applications."

However, nothing in Venier alone or combined with other cited references, would provide a person of ordinary skill in the art a reasonable expectation of the six fold increase in the life of a magnetic recording medium.

Claims 11 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stirniman et al. ("600") in view of Venier et al ("023") and Venier et al. (IDS paper) and Babb et al. ("547") (hereafter referred to as SVVB) and further in view of Patsidis et al. ("351"). In making the rejection, the Examiner states the following:

SVVB disclose the claimed invention as described above.

SVVB fail to explicitly disclose a hydrocarbyl substitution meeting applicant's claimed limitations (i.e. a dicyclic pentane, pentene or pentadiene).

However, Patsidis et al. teach that bridged cyclopentadiene compounds are known in the art, wherein the bridge can be just a hydrocarbyl CH<sub>2</sub> group (col. 1, lines 28-38 and col. 2, lines 19-49).

It would therefore have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of SVVB to use hydrocarbyl substitutions meeting applicant's claimed limitations as taught by Patsidis et al. since one of ordinary skill in the art would be motivated to make and use the claimed hydrocarbyl substituted lubricant in searching for a hydrocarbyl substituted cyclopentane, cyclopentene or cyclopentadiene. The necessary motivation rises from the expectation that similar compounds will have similar properties. In re Payne, 606 F.2d 303, 203 USPQ 245 (CCPA 1979). The only difference between the disclosed lubricants and the lubricants claimed in the preceding claims is in the choice of the non-functionalized hydrocarbyl group that is substituted on the identical base compound.

*Office Action of February 7, 2002, pages 5-6.*

Applicants have reviewed the above references and respectfully disagree that the above references, singularly or in combination, render the claimed invention obvious. Applicants' reasons are stated as above.

Claims 12 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stirniman et al. ("600") in view of Venier et al ("023") and Venier et al. (IDS paper) and Babb et al. ("547") (hereafter referred to as SVVB) and further in view of Venier and Casserly (IDS reference from Symposium on the Chem. of Lubricants, Boston Meeting, pe-print, 35(2), 1990). In making the rejection, the Examiner states the following:

SVVB disclose the claimed invention as described above.

SVVB fail to explicitly disclose a hydrocarbyl substitution meeting applicant's claimed limitations (i.e. a dicyclic pentane, pentene or pentadiene).

However, Venier and Casserly teach that Diels-Alder functionalized cyclopentane based materials are known in the lubricating art as equivalents to cyclopentane, cyclopentene and cyclopentadiene based lubricants (Background section).

It would therefore have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of SVVB to use hydrocarbyl substitutions meeting applicant's claimed limitations as taught by Venier and Casserly since one of ordinary skill in the art would be motivated to make and use the claimed hydrocarbyl substituted lubricant in searching for a hydrocarbyl substituted cyclopentane, cyclopentene or cyclopentadiene. The necessary motivation rises from the expectation that similar compounds will have similar properties. In re Payne, 606 F.2d 303, 203 USPQ 245 (CCPA 1979). The only difference between the disclosed lubricants and the lubricants claimed in the preceding claims is in the choice of the non-functionalized hydrocarbyl group that is substituted on the identical base compound.

*Office Action of February 7, 2002, pages 6-7.*

Applicants have reviewed the above references and respectfully disagree that the above references, singularly or in combination, render the claimed invention obvious. Applicants' reasons are stated as above.

Claims 36 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stirniman et al. ("600") in view of Venier et al ("023") and Venier et al. (IDS paper) and Babb et al. ("547") (hereafter referred to as SVVB) and further in view of Sanechika et al. ('593) and Ng ("216"). In making the rejection, the Examiner states the following:

SVVB disclose the claimed invention as described above. For purposes of evaluating the prior art, the examiner has taken "functionalized" to mean "an organic group that includes carbon, hydrogen, and a functional group (e.g. a polar group)", as defined by the applicants (page 7, lines 2-7).

While SVVB disclose using mixtures of hydrocarbyl substituted lubricants (Venier et al. ('023), col. 5, lines 48-63 and col. 7, line 63 bridging col. 8, line 25), SVVB fail to explicitly disclose using a mixture of one non-functionalized cyclic lubricant and one functionalized cyclic lubricant.

However, Sanechika et al. teach using a mixture of lubricants comprising a fluorinated lubricant and a branched alkyl aromatic non-functionalized lubricant in order to regulate the viscosity and lubricating properties of the overall lubricant, as well as to provide improved low temperature performance (col. 4, line 65 bridging col. 5, line 7 and col. 6, lines 28-46). The examiner acknowledges that Sanechika et al. is not directed to a combination of a non-functionalized cyclopentane, pentene or pentadiene with a functionalized cyclopentane, pentene, or pentadiene, but is instead directed to a functionalized aromatic material combined with a non-functionalized aromatic material, though Sanechika et al. does disclose that various types of group exhibiting aromaticity can be used (col. 9, lines 20-29).

However, Ng teaches that for magnetic recording media, the aromatic functional groups are equivalent to cyclopentane, cyclopentene and cyclopentadiene groups for purposes of having free electrons available to bond the lubricant to the surface to be lubricated. As such, the aromatic groups used by Sanechika et al. are deemed to be equivalent to the claimed cyclopentane, pentene and pentadienes.

It would therefore have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of SVVB to use a mixture of functionalized cyclopentane, pentene, and pentadienes and non-functionalized cyclopentane, pentene, and pentadienes as taught by Sanechika et al. and Ng since a mixture of functionalized cyclopentane, pentene, and pentadienes would provide improved low temperature performance, as well as allow accurate control of the viscosity and lubricating properties of the mixture.

*Office Action of February 7, 2002, pages 7-8.*

Applicants have reviewed the above references and respectfully disagree that the above references, singularly or in combination, render the claimed invention obvious. Applicants' reasons are stated as above.



Claims 36 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stirniman et al. ("600") in view of Venier et al. ("023") and Venier et al. (IDS paper) and Babb et al. ("547") (hereafter referred to as SVVB) and further in view of Tsuchiya et al. ("516") and Hayashi ("983"). In making the rejection, the Examiner states the following:

SVVB disclose the claimed invention as described above. For purposes of evaluating the prior art, the examiner has taken "functionalized" to mean "an organic group that includes carbon, hydrogen, and a functional group (e.g. a polar group)", as defined by the applicants (page 7, lines 2-7).

While SVVB disclose using mixtures of hydrocarbyl substituted lubricants (Venier et al. ('023), col. 5, lines 48-63 and col. 7, line 63 bridging col. 8, line 25), SVVB fail to explicitly disclose using a mixture of one non-functionalized cyclic lubricant and one functionalized cyclic lubricant.

However, Tsuchiya et al. teach that the addition of polar groups to cyclopentane, pentene or pentadiene results in improved flowability, heat resistance and electrical characteristics (col. 1, lines 10-20 and col. 1, line 61 bridging col. 2, line 51).

Furthermore, Hayashi teaches that one of ordinary skill in the art would know that "hydrocarbyl substituted" as disclosed by Venier et al. ('023) would cover functionalized substituents (col. 2, line 40 bridging col. 3, line 30).

It would therefore have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of SVVB to include a mixture of lubricants meeting applicant's claimed limitations as taught by Tsuchiya et al. and Hayashi since a mixture of functionalized and non-functionalized lubricants would allow tailoring of not only the viscosity and lubricating properties, but also the flowability, heat resistance and electrical characteristics.

*Office Action of February 7, 2002, pages 8-9.*

Applicants have reviewed the above references and respectfully disagree that the above references, singularly or in combination, render the claimed invention obvious. Applicants' reasons are stated as above.

**CONCLUSION**

For the above reasons, Applicants respectfully submit that all pending claims, *i.e.*, claims 1, 2, 11 - 14, and 23 - 37, are patentable over the prior art. Applicants have addressed all of the Examiner's rejections. In conjunction with the arguments above, Applicants believe that the claims are now in condition for allowance and respectfully request that the Examiner grant such an action. If any questions or issues remain in the resolution of which the Examiner feels will be advanced by a conference with the Applicants' attorney, the Examiner is invited to contact the attorney at the number noted below.

No fees are due as a result of this Reply. The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment, to Deposit Account No. 10-0447, reference 42053.6USPT(BAI).

Respectfully submitted,

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A Professional Corporation

*CTM Filed #46,991*

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